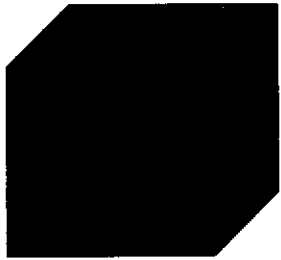
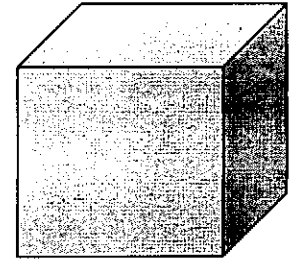


CUBING

Handout



What is the Point?



- Cubing gives students who like to use their hands and move around a chance to feel like they are “playing” while learning.
- Cubing gives students a chance to look at a concept from a series of different perspectives.
- Cubing is very flexible and encourages depth and complexity.
- Cubing allows the teacher to differentiate for readiness in a very un-obvious way. Since all students are working with cubes, students are not aware that their neighbors might be doing something a little different.

Blackline Master 21:

Checklist for Creating a Learning Contract

This process can be done by the teacher or in cooperation with a student or group of students.

- ☐ Identify the KUDos—What do you want the student(s) to know, understand, and be able to do as a result of completing the contract?
- ☐ Brainstorm a variety of tasks the student(s) could complete.
- ☐ Eliminate the tasks that will not lead the student(s) to what you want them to know, understand, and be able to do.
- ☐ Consider how the contract will be differentiated (by interest, readiness, or learning profile).
- ☐ Decide on a reasonable timeline to complete the tasks and how many students will be asked to complete it.
- ☐ Determine how and the frequency with you will check in with students during their contract work. Make this explicit in the contract.
- ☐ Outline how students will ask for help, if needed.
- ☐ List the resources that students are able to use, and how they should be cited.
- ☐ Determine how the project(s) will be evaluated. Give the rubrics or other evaluation tools to the students and discuss together before they start the assignment.
- ☐ Write up contract in a businesslike manner. Be sure to include places for dates and signatures.

Creating a Cubing Exercise

- Start by deciding which part of your unit lends itself to optional activities. Decide which concepts in this unit can you create a cube for. Is it possible for you to make 3 cubes for 3 different interests, levels, or topics?
- **First Step:** (use one of the cubes)
 - Write 6 questions that ask for information on the selected unit.
 - Use your 6 levels of Bloom, intelligence levels, or any of the cubing statements to design questions.
 - Make questions that use these levels that probe the specifics of your unit.
 - Keep one question opinion based – no right or wrong.
- **Second Step:** (use other cubes)
 - Use the first cube as your “average” cube, create 2 more using one as a lower level and one as a higher level.
 - Remember all cubes need to cover the same type of questions, just geared to the level, don’t water down or make too busy!
 - Label your cubes so you know which level of readiness you are addressing.
 - Hand your partner the cubes and ask if they can tell high, medium, or low. If they can’t tell, adjust slightly.
- **Third Step:**
 - Always remember to have an easy problem on each cube and a hard one regardless the levels.
 - Color code the cubes for easy identification and also if students change cubes for questions.
 - Decide on the rules: Will the students be asked to do all 6 sides? Roll and do any 4 sides? Do any two questions on each of the 3 cubes?

Places to get questions:

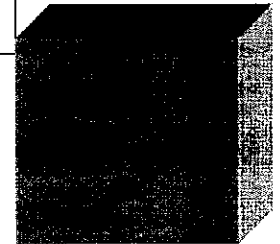
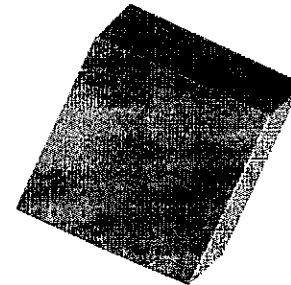
Old quizzes, worksheets, textbook-study problems, students generated.

CUBING

1. **Describe it:** Look at the subject closely (perhaps with your senses as well as your mind)
2. **Compare it:** What is it similar to? What is it different from?
3. **Associate it:** What does it make you think of? What comes to your mind when you think of it? Perhaps people? Places? Things? Feelings? Let your mind go and see what feelings you have for the subject.
4. **Analyze it:** Tell how it is made? What are it's traits and attributes?
5. **Apply it:** Tell what you can do with it. How can it be used?
6. **Argue for it or against it:** Take a stand. Use any kind of reasoning you want – logical, silly, anywhere in between.

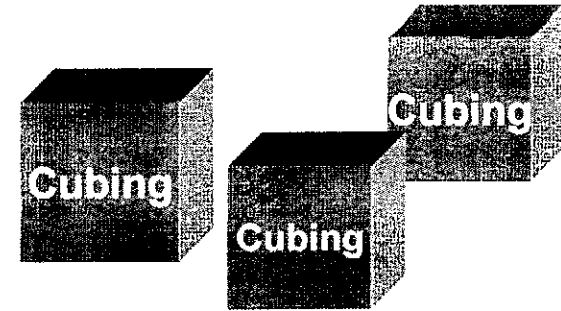
Or you can . .
..

- Rearrange it
- Illustrate it
- Question it
- Satirize it
- Evaluate it
- Connect it
- Cartoon it
- Change it
- Solve it



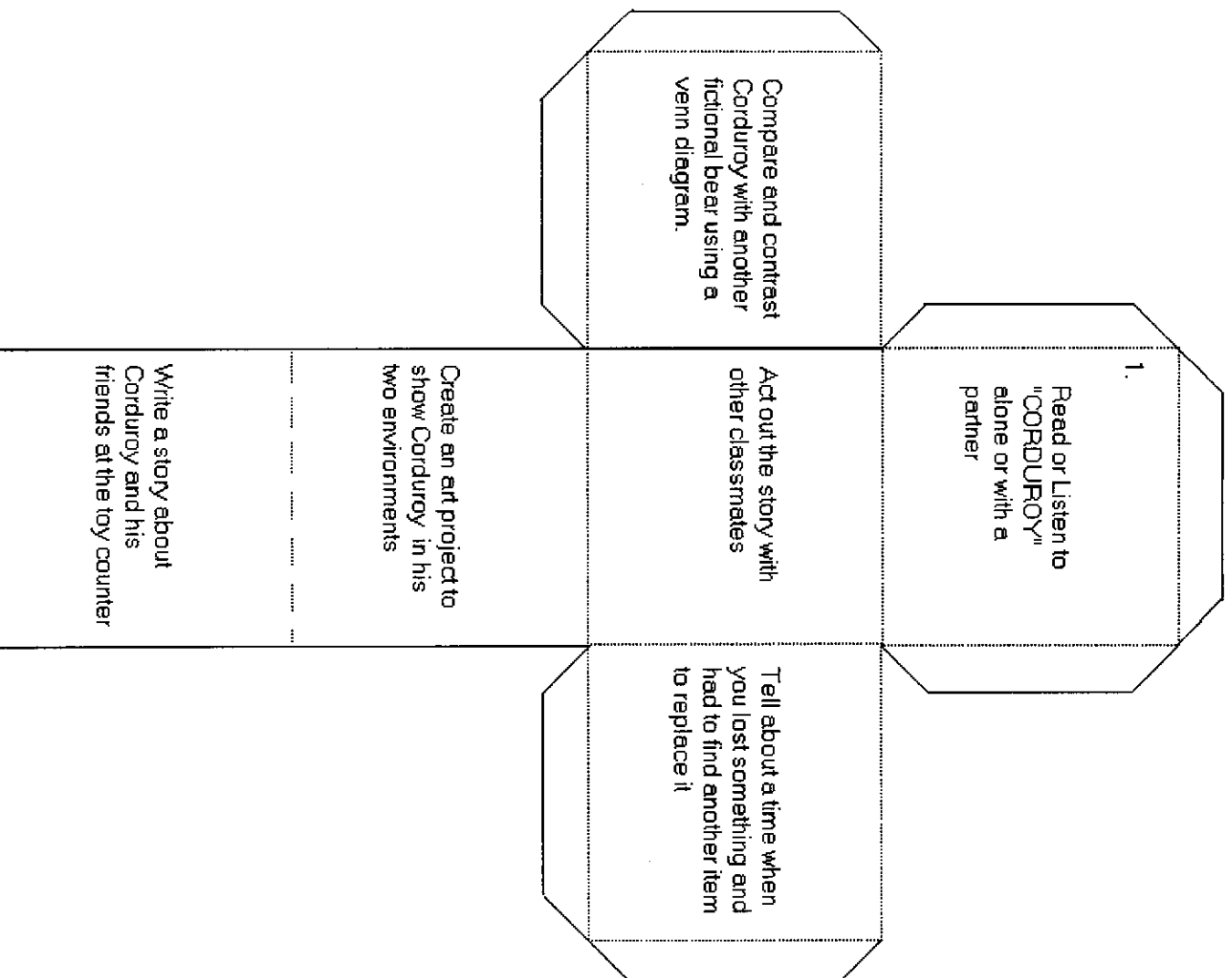
Ideas for Cubing

- **Arrange** _____ into a 3-D collage to show _____
- **Make** a body sculpture to show _____
- **Create** a dance to show _____
- **Do** a mime to help us understand _____
- **Present** an interior monologue with dramatic movement that _____
- **Build/construct** a representation of _____
- **Make** a living mobile that shows and balances the elements of _____
- **Create** authentic sound effects to accompany a reading of _____
- **Show** the principle of _____ with a rhythm pattern you create. Explain to us how that works.

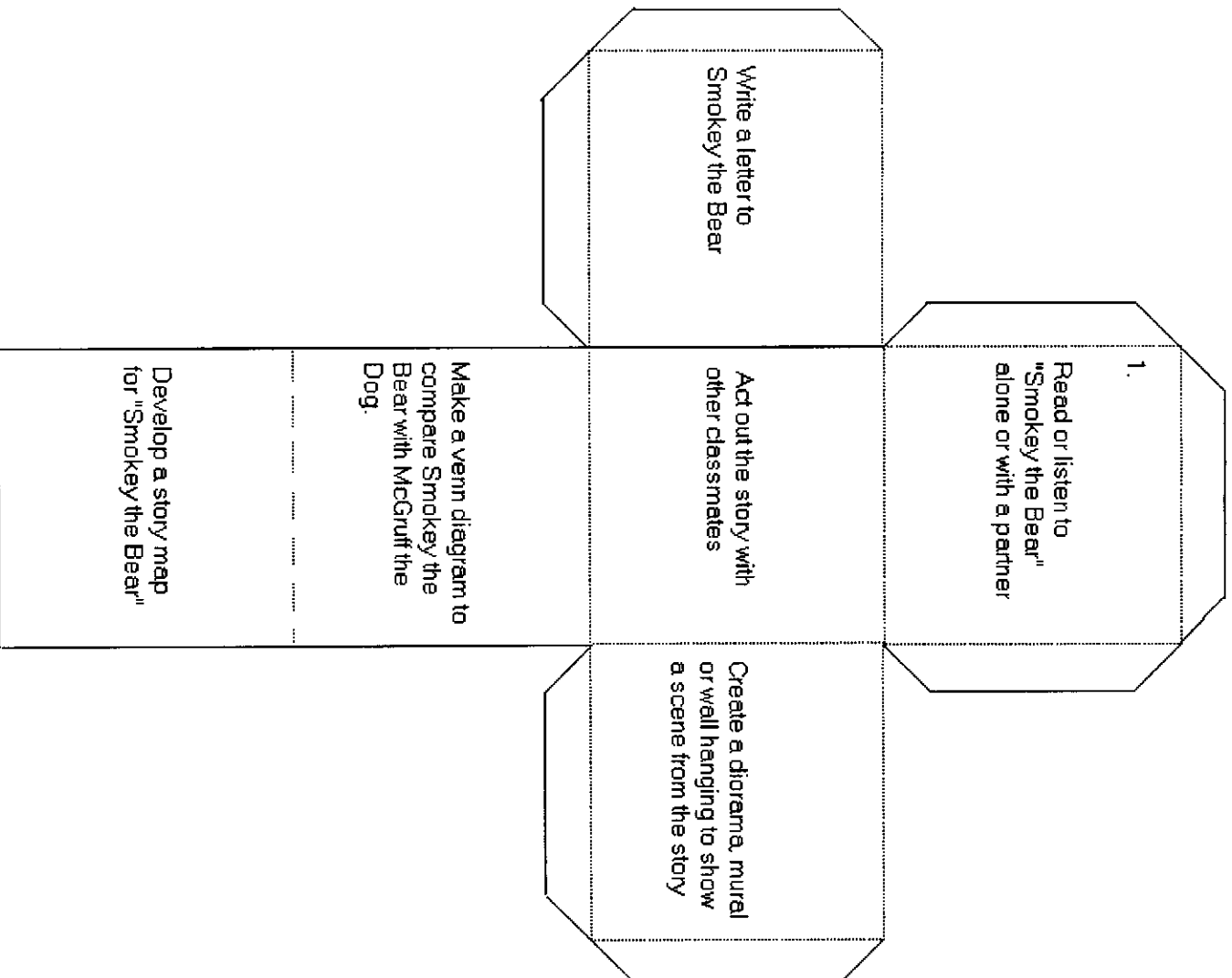


Ideas for Cubing in Math

- **Describe** how you would solve _____
- **Analyze** how this problem helps us use mathematical thinking and problem solving
- **Compare and contrast** this problem to one on page _____.
- **Demonstrate** how a professional (or just a regular person) could apply this kink or problem to their work or life.
- **Change** one or more numbers, elements, or signs in the problem. Give a rule for what that change does.
- **Create** an interesting and challenging word problem from the number problem. (Show us how to solve it too.)
- **Diagram or illustrate** the solution to the problem. Interpret the visual so we understand it.



1. Read or listen to "Winnie the Pooh" alone or with a partner	Complete an art project highlighting the sequence of the story(first, next, last)	List the characteristics of Winnie and two other characters in the story
Analyze the story and explain what you learned from the story		
Compare and Contrast Winnie the Pooh and another fictional bear		
Write your own short story about Winnie the Pooh		



<p>Red Cube</p>	<p>Describe</p> <p>Your favorite picture in the story <u>Family Pictures</u>. Tell why you picked that one.</p>	<p>Big Idea:</p> <p>To understand basic connections that all people have regardless of their culture in order to function in the real world</p>
<p>Compare</p> <p>Your favorite picture in the story <u>Family Pictures</u> to a similar activity in your life. You may use words and/or pictures</p>	<p>List</p> <p>Words that describe your feelings about the Mexican culture as you look at each picture in the story.</p>	<p>Chart</p> <p>Using a Venn diagram, show your favorite things and compare to the favorite things you found in the story. Find common areas that you and the story share.</p>
<p>Third Grade Southwest Unit Cubing Example</p> <p><u>Family Pictures</u> by Carmen Lomas Garza</p>	<p>Analyze</p> <p>The favorite things in the story by understanding why these might be traditions in the culture. If you were a researcher asked about the important things in the Mexican culture, what would you say.</p>	<p>Adapted from a lesson by Joy Peters, Nebraska</p>
	<p>Justify</p> <p>The story describes a family that speaks a different language and come from a different culture. Justify thy it is important to meet people who speak a different language and have a different</p>	

culture.

<p>Orange Cube</p>	<p>Describe</p> <p>The Mexican culture using at least three sentences with three describing words in each sentence.</p>	<p>Big Idea:</p> <p>To understand basic connections that all people have regardless of their culture in order to function in the real world</p>
<p>Compare</p> <p>Use the Compare/Contrast graphic organizer and look at areas of food, shelter, traditions, family life, fun</p>	<p>Pretend</p> <p>That you are a child from Mexico. Tell me about your day. What would your chores be? What would you eat? How would you spend your free time? Would you take naps? Tell me why.</p>	<p>Critique</p> <p>Find another story to read at the reading center. Compare it to <u>Family Pictures</u> and discuss elements you liked and did not like of either.</p>
<p>Third Grade Southwest Unit Cubing Example <u>Family Pictures</u> by Carmen Lomas Garza</p>	<p>Create</p> <p>Make your own family album by drawing at least five special activities your family shares</p>	
	<p>Dance</p> <p>Choreograph a dance or mime to represent three main ideas that you learned about the Mexican culture.</p>	

Adapted from a lesson by
Joy Peters, Nebraska

- Grade 3 Weather Watch

	<p>1. Define the following terms:</p> <ul style="list-style-type: none"> a. tornado b. "tornado watch" c. funnel d. spin e. counterclockwise f. twister g. nonfiction 	<p><i>Key</i> <i>Bloom's Taxonomy</i></p> <ul style="list-style-type: none"> 1. Knowledge 2. Comprehension 3. Application 4. Analysis 5. Synthesis 6. Evaluation
<p>2. Make a three-part drawing that shows a town before, during and after a tornado. Use labels to explain what is happening.</p>	<p>3. Tornadoes are one of the most powerful forces in nature. Nature's power can also be seen in waterfalls, ocean waves, thunderstorms, and even breezes. Write a paragraph describing some force you have observed in nature. Use vivid adjectives to best describe the power of nature in your example.</p>	<p>4. Compare a tornado with a hurricane. Use these categories to report what you found:</p> <ul style="list-style-type: none"> • Where is each usually found? • How strong are the winds? • What kind of damage does each one cause? <p>Report results on a chart.</p>
	<p>5. Working with the powerful forces of nature can be dangerous. Which of the following jobs do you think is most dangerous? Which is the least dangerous? Why?</p> <ul style="list-style-type: none"> • Forest firefighter • Park Ranger • Tornado Watcher • "On-the-scene" weather reporter 	
	<p>6. Write an adventure story about a tornado. You may make it appear to be very real with people doing things that would appear to be normal. Or, you could create a story where the characters are different than life -- like a talking cat or a character like Superman.</p>	

Grade 3 – Weather Watch

	<p>1. Answer the following questions:</p> <p>a. What the signs that a tornado is coming?</p> <p>b. What causes tornados?</p> <p>c. What dangerous effects can a tornado have?</p> <p>d. What should you do if a tornado is coming?</p>	<p><i>Key</i></p> <p><i>Bloom's Taxonomy</i></p> <p>1. <i>Knowledge</i></p> <p>2. <i>Comprehension</i></p> <p>3. <i>Application</i></p> <p>4. <i>Analysis</i></p> <p>5. <i>Synthesis</i></p> <p>6. <i>Evaluation</i></p>
<p>2. Create a web, diagram or drawing that shows the basic features of a tornado. Include how it is formed, its' make-up, speed, path, and lifespan.</p>	<p>3. Your school is located in a potential tornado area. Develop a set of directions for what your class should do in case of a tornado warning.</p>	<p>4. Create four to six questions a reporter could ask observers or victims of a tornado. The questions must get people to talk about what happened – not answered in “YES” or “NO” responses. Act out the interview with a friend.</p>
	<p>5. Design a scale for evaluating tornados. Describe how your scale would work.</p>	
	<p>6. You are a tornado. Write a story (or poem) about your life, feelings, and thoughts.</p>	

Grade 3 Weather Watch

1. What are the seven states that have the most tornados?

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

**Key
Bloom's Taxonomy**

1. Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation

2. Draw a picture of a tornado. With arrows, labels on the picture and words describe how the tornado is formed.

3. If you were "Mother Nature" and wanted to cook-up a tornado, what ingredients would you mix together and in what order.

4. What are the differences between a tornado and a thunderstorm? What is the same?

What are the differences between a tornado and a blizzard? What is the same?

5. What are the duties of a 'tornado watcher'? Is it a dangerous job? Would you like to be one? Why or why not?

6. Trace on a map the path of an average tornado starting five miles west of your home and traveling east. What would be destroyed? How many people might be hurt?

Aligned with Grade 3 Weather Watch
Unit Houghton Mifflin by T. Giles
November 8, 2000

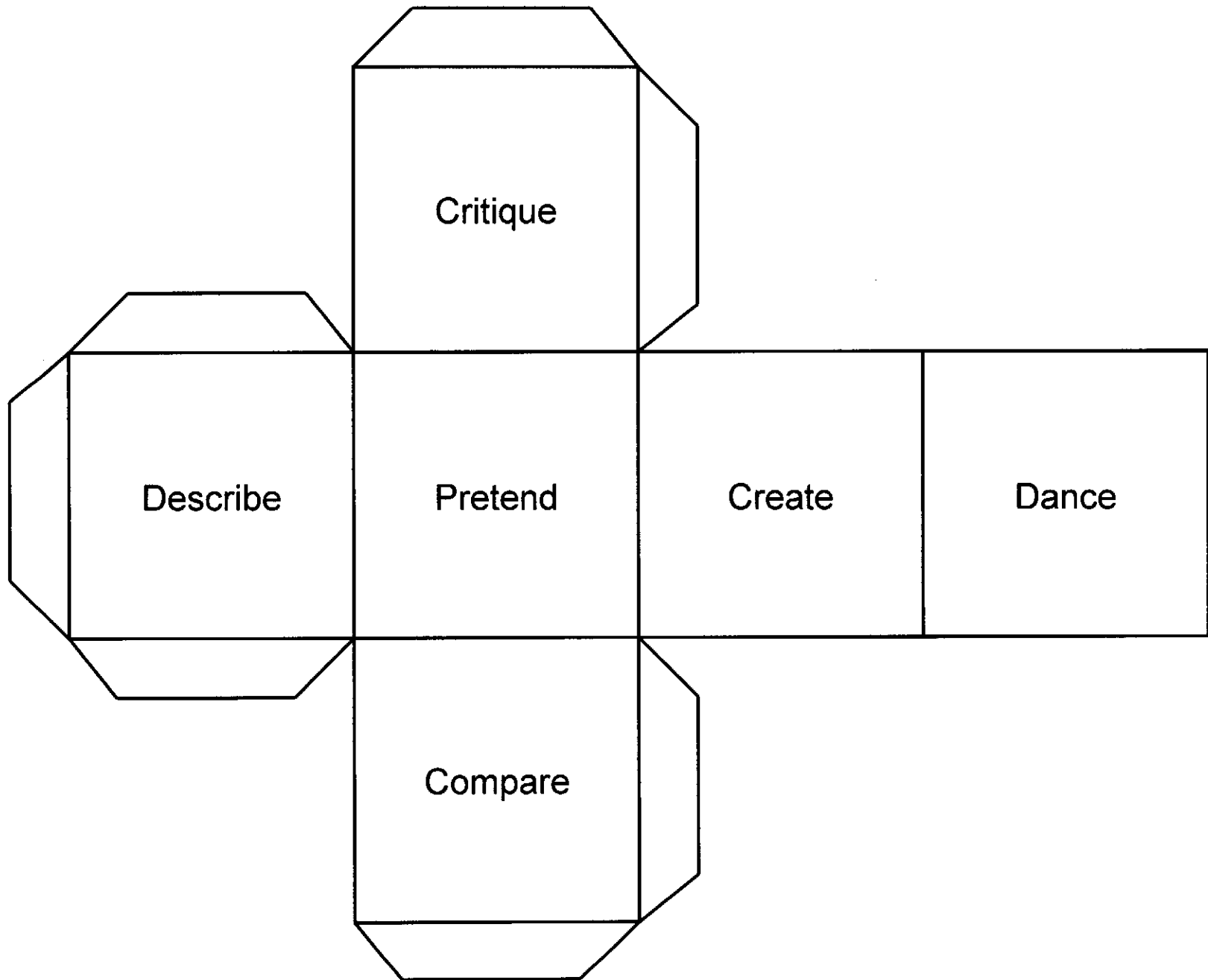
Cubing with *Charlotte's Web*

Basic Cube

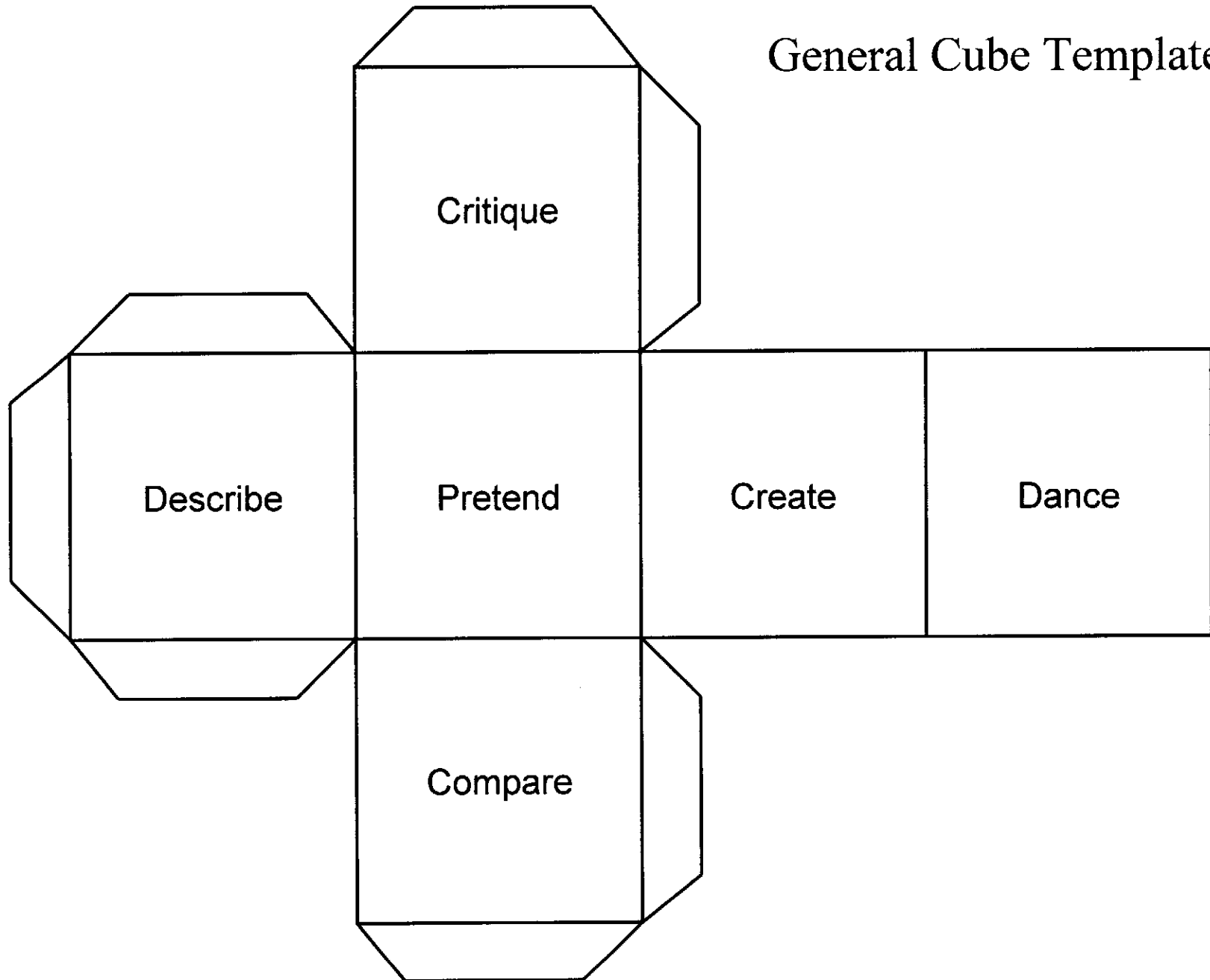
1. Draw Charlotte as you think she looks.
2. Use a Venn diagram and compare Charlotte and Fern.
3. Use a comic strip to tell what happened in this chapter.
4. Shut your eyes and describe the barn. Jot down your ideas.
5. Predict what will happen in the next chapter using symbols.
6. In your opinion, why is Charlotte a good friend?

Abstract Cube

1. Use a graphics program on the computer and create a character web for Wilbur.
2. Use symbols on a Venn diagram to compare Wilbur and Charlotte.
3. Draw the farm and label the items, people, and buildings.
4. Use a storyboard to show the progress of the plot to this point.
5. What is the message that you think the writer wants people to remember? Draw a symbol that illustrates your ideas.
6. When you think of the title, do you agree or disagree that it is a good choice? Why or why not?



General Cube Template



**World
Exploration:
5th Grade**

Social Studies Level 1

<p><u>Compare/Contrast</u> Using a Venn diagram, compare your explorer to someone you know who has similar qualities.</p>	<p><u>Significance</u> Write a paragraph describing the importance of this exploration/discovery (Check for topic sentence, supporting details, conclusion.)</p>	<p><u>Cause/Effect</u> Using the graphic organizer show at least 5 things that happened leading to the discovery and 5 things that happened as a result.</p>	<p><u>Evaluate</u> Pretend you are an explorer. Make an inventory of what you need for your voyage. Then mark your top five items in case you can't buy them all.</p>
	<p><u>Timeline</u> Create a timeline of important events (50 years before & 50 years after) that led to and followed the discovery.</p>		
<p><u>Relate</u> Think of an astronaut (not John Glenn) who is similar to your explorer and compare them.</p>			

K. Brimijoin & D. Cooper, 2000

**World
Exploration:
5th Grade**

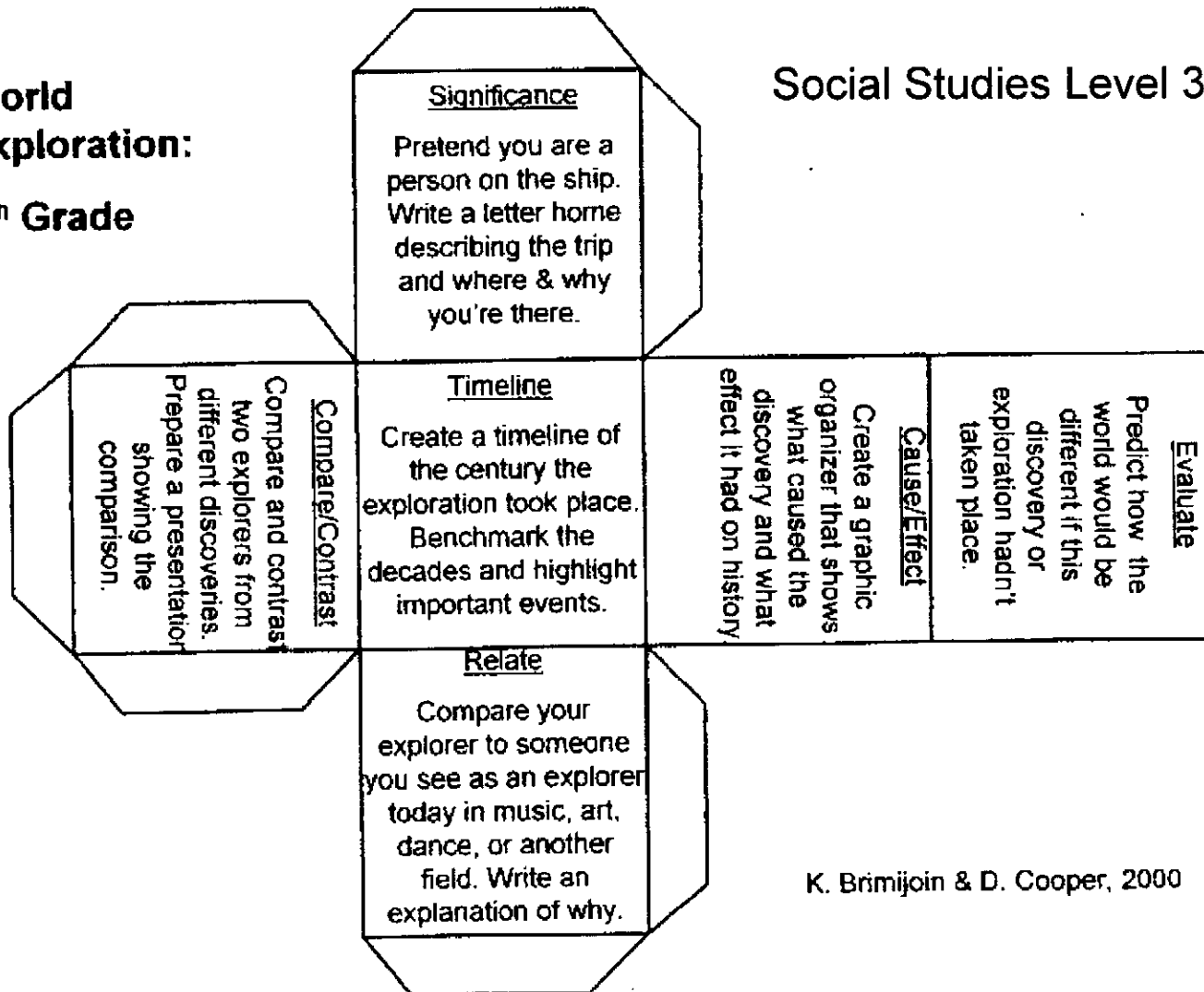
Social Studies Level 2

<p><u>Compare/Contrast</u></p> <p>Compare your explorer to someone you know. Draw a picture of each. List below them the ways they are alike.</p>	<p><u>Timeline</u></p> <p>Create a string picture timeline of the important events that led to your explorer's discovery.</p>	<p><u>Cause/Effect</u></p> <p>Using the graphic organizer, show 2 things that happened leading to the discovery and 2 things that happened after the discovery.</p>	<p><u>Evaluate</u></p> <p>Pretend you are the explorer. How would you travel his route today? Remember to think about refueling, times of departure and arrival and current maps.</p>
<p><u>Significance</u></p> <p>Write an outline describing what is important about this exploration or discovery.</p>	<p><u>Relate</u></p> <p>Trace the route of your explorer on the old map and the map today. Share (write) how you think the world has changed.</p>		

K. Brimijoin & D. Cooper, 2000

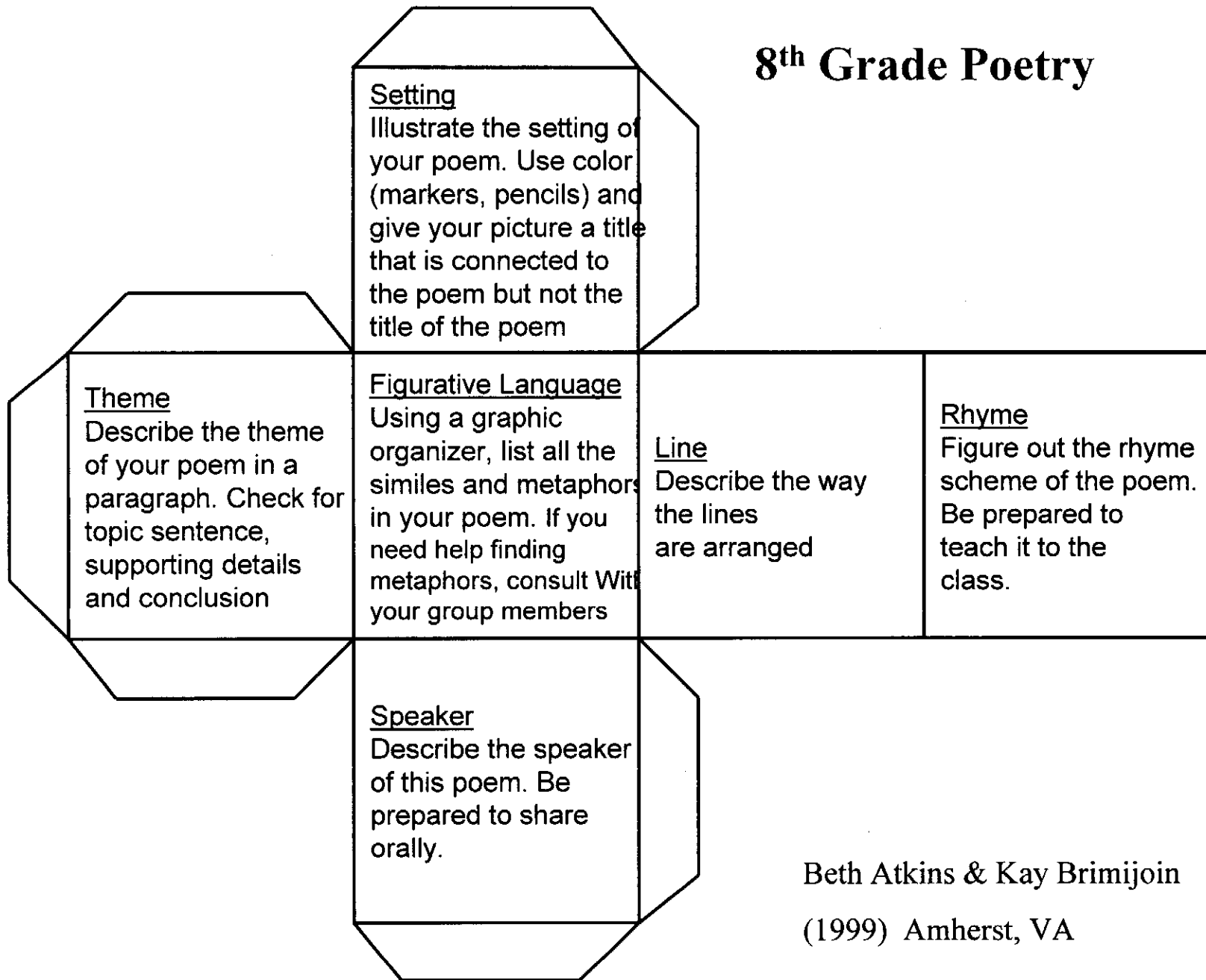
**World
Exploration:
5th Grade**

Social Studies Level 3



K. Brimijoin & D. Cooper, 2000

8th Grade Poetry



Beth Atkins & Kay Brimijoin
(1999) Amherst, VA

8th Grade Poetry

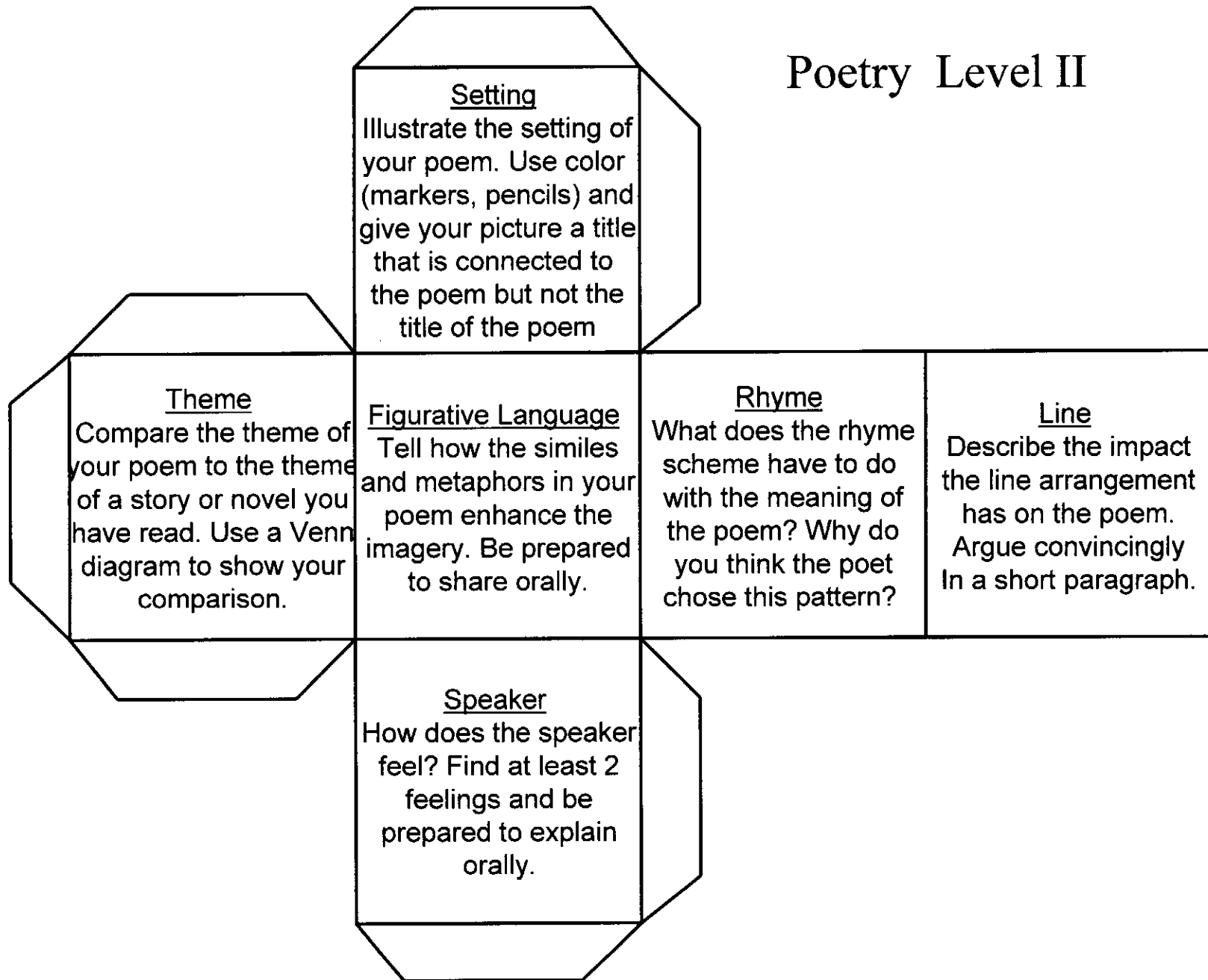
<u>Theme</u> Compare the theme of your poem to the theme of a story or novel you have read. Use a Venn diagram to show your comparison.	<u>Setting</u> Illustrate the setting of your poem. Use color (markers, pencils) and give your picture a title that is connected to the poem but not the title of the poem	<u>Rhyme</u> What does the rhyme scheme have to do with the meaning of the poem? Why do you think the poet chose this pattern?	
<u>Figurative Language</u> Tell how the similes and metaphors in your poem enhance the imagery. Be prepared to share orally.	<u>Line</u> Describe the impact the line arrangement has on the poem. Argue convincingly in a short paragraph.		
<u>Speaker</u> How does the speaker feel? Find at least 2 feelings and be prepared to explain orally.			

Beth Atkins & Kay Brimijoin
(1999) Amherst, VA

Poetry Level I

	<p><u>Setting</u> Illustrate the setting of your poem. Use color (markers, pencils) and give your picture a title that is connected to the poem but not the title of the poem</p>	
<p><u>Theme</u> Describe the theme of your poem in a paragraph. Check for topic sentence, supporting details and conclusion</p>	<p><u>Figurative Language</u> Using a graphic organizer, list all the similes and metaphors in your poem. If you need help finding metaphors, consult With your group members</p>	<p><u>Line</u> Describe the way the lines are arranged</p>
	<p><u>Speaker</u> Describe the speaker of this poem. Be prepared to share orally.</p>	<p><u>Rhyme</u> Figure out the rhyme scheme of the poem. Be prepared to teach it to the class.</p>

Poetry Level II



Biology – A Differentiated Lesson Using Cubing by Readiness, and Jigsaw

Understand: Functions of cell organelles relatedness of each organelle's function with others'

Know: Key Vocabulary (nucleus, mitochondria, endoplasmic reticulum, ribosome, nucleolus, vacuole, golgi body, lysosome, cell membrane)

Do: Analyze and explain a facet of cell function and interrelationship of parts

First: Class reading and discussion of cell, parts, and interrelationships – followed by a diagnostic quiz

Next: The teacher assigns students to Jigsaw groups of 6 – and a task numbered 1-6 within the Jigsaw groups.

Tasks escalate in difficulty and may also interest or learning profiles.

1. **Describe** cell parts (structure) and function
2. **Illustrate** a cell with organelles and functions
3. **Analyze** how each cell part is related to others
4. **Compare** location of the organelle with its functions and relationships
5. **Connect** how interrelationships among organelle functions are like other interrelationships among organelle functions are like other interrelationships in life
6. **Apply** what you've learned to predict how organism functions are like cell functions.

Within "specialty" groups (all the 4's, for example) students devise a way of sharing their tasks and understandings with the Jigsaw "home base" groups. Once back in Jigsaw home base groups, each individual is responsible for

- a) presenting and answering questions about one facet of the cube, and
- b) taking notes, asking questions, achieving understanding about the other facets of the cube.

Students have an opportunity to pose questions and ask for clarification from the whole class. They then select either a quiz or a journal entry on the topic to demonstrate their understanding.

Energy

1. List 9 energy sources	Indicate if the energy source is a pollutant or non-pollutant	List an advantage or disadvantage of each energy source
Define each energy source	Indicate if the energy source is renewable or non-renewable	Design a way to present your information to the class

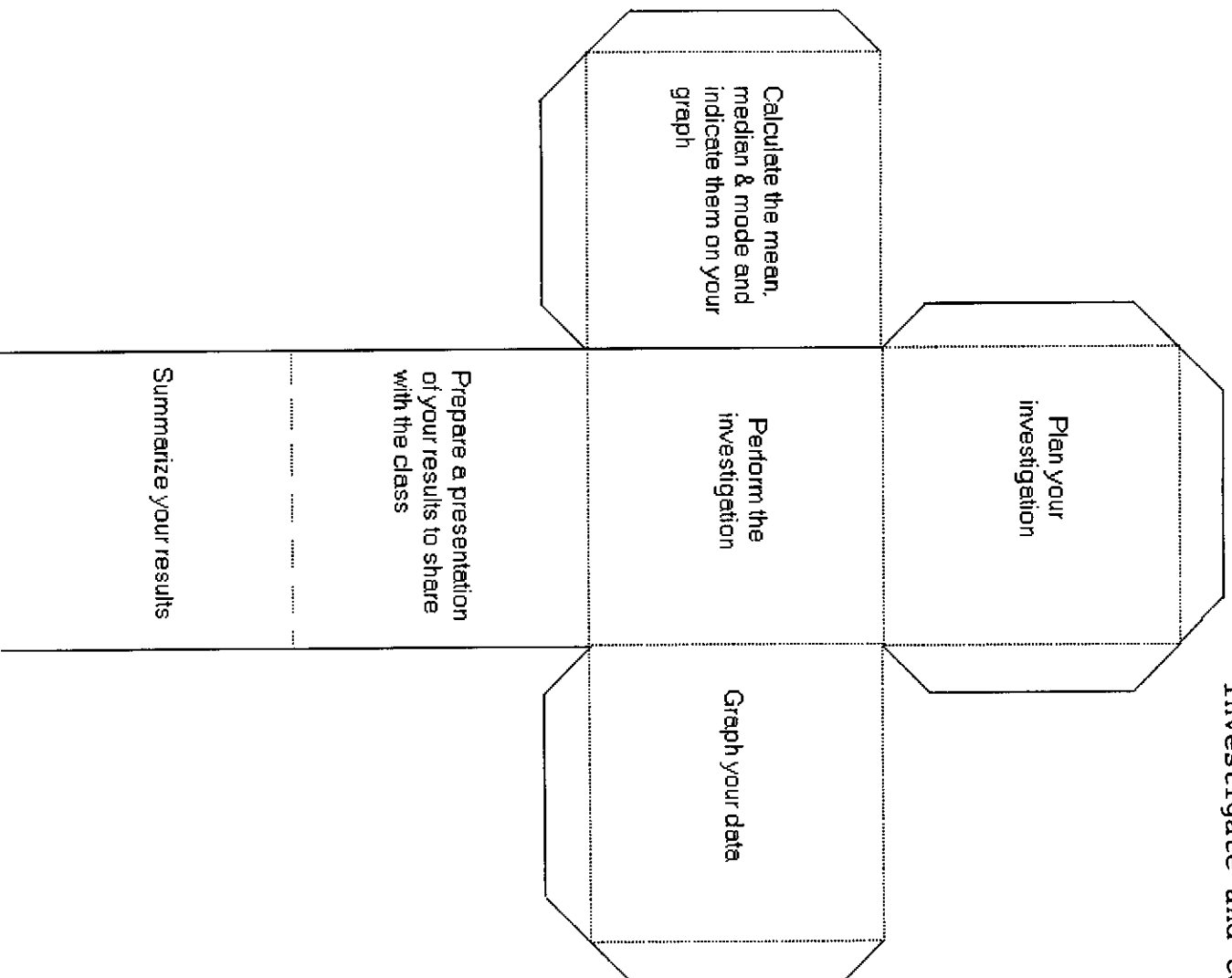
Energy

1. List and define 9 energy sources	Forecast the future of energy sources	Explain how each energy source affects the environment
Classify the energy sources in atleast two ways	Compare and contrast : the advantages and disadvantages of each energy source	
Present your information to the class in the form of a debate		

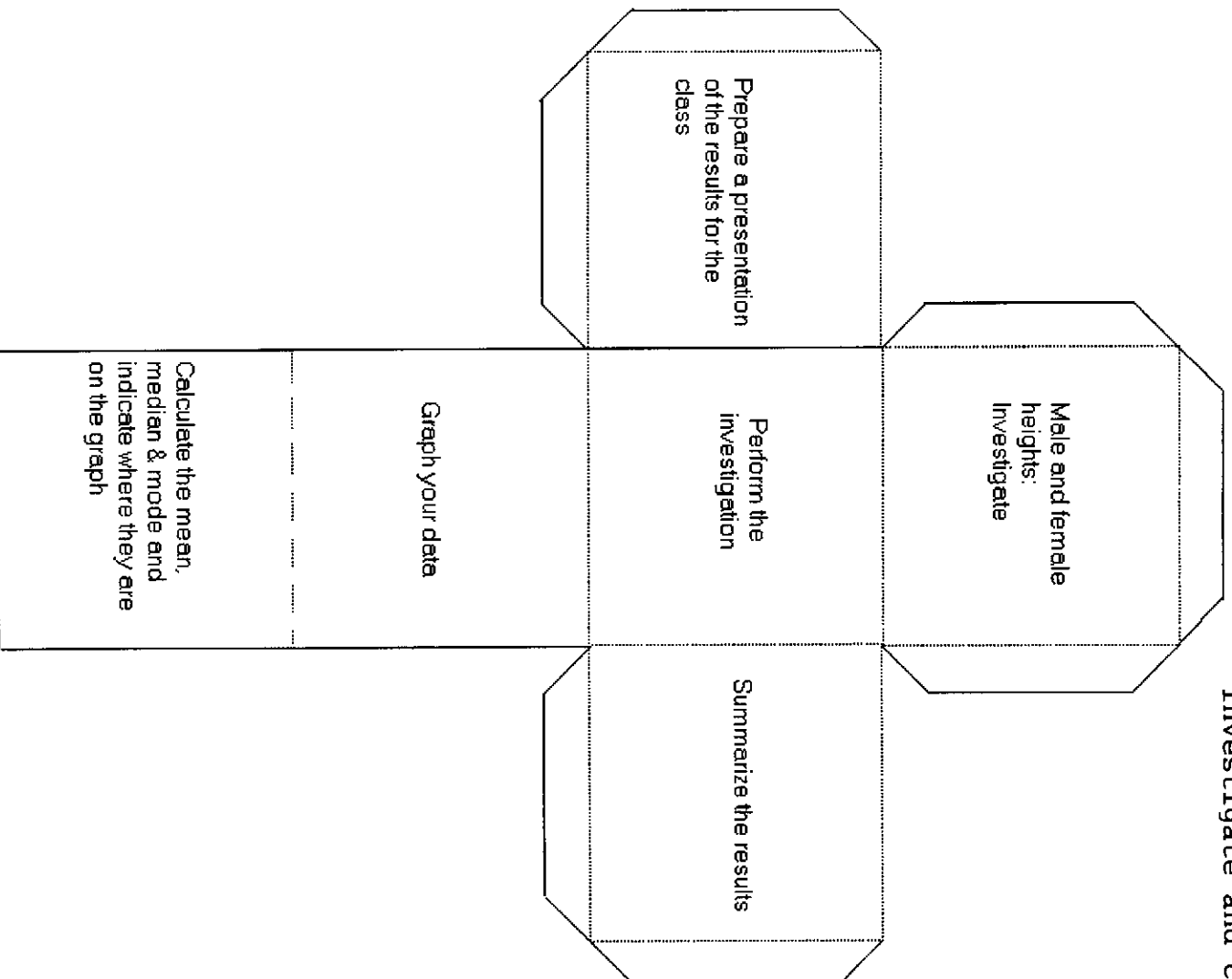
Energy

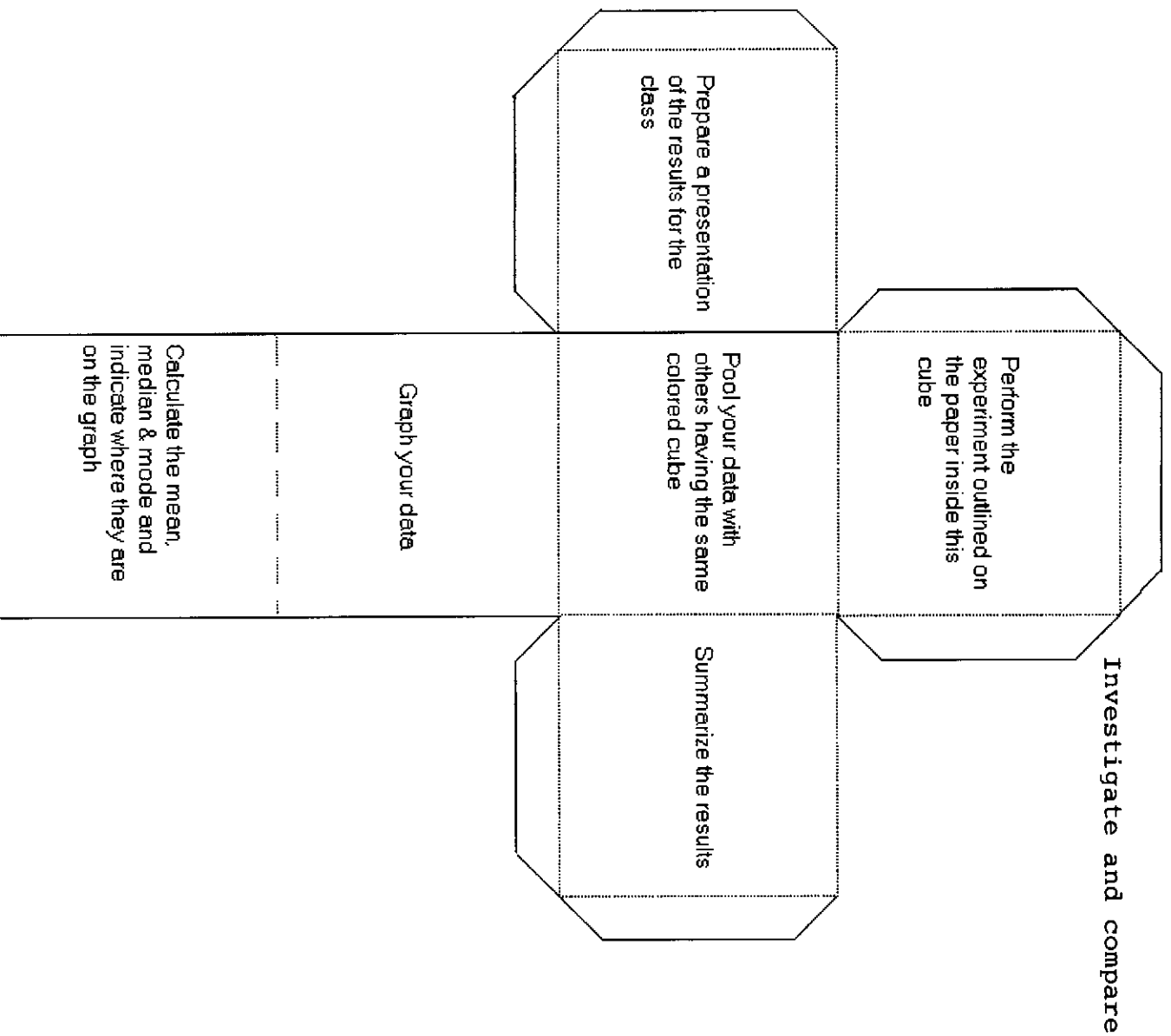
1. List and define 9 energy sources	Explain how each energy source is produced	Classify the energy sources as renewable and non-renewable
Compare and contrast two energy sources		
Categorize the energy sources as pollutants or non-pollutants		
Present your information to the class		

Investigate and compare



Investigate and compare

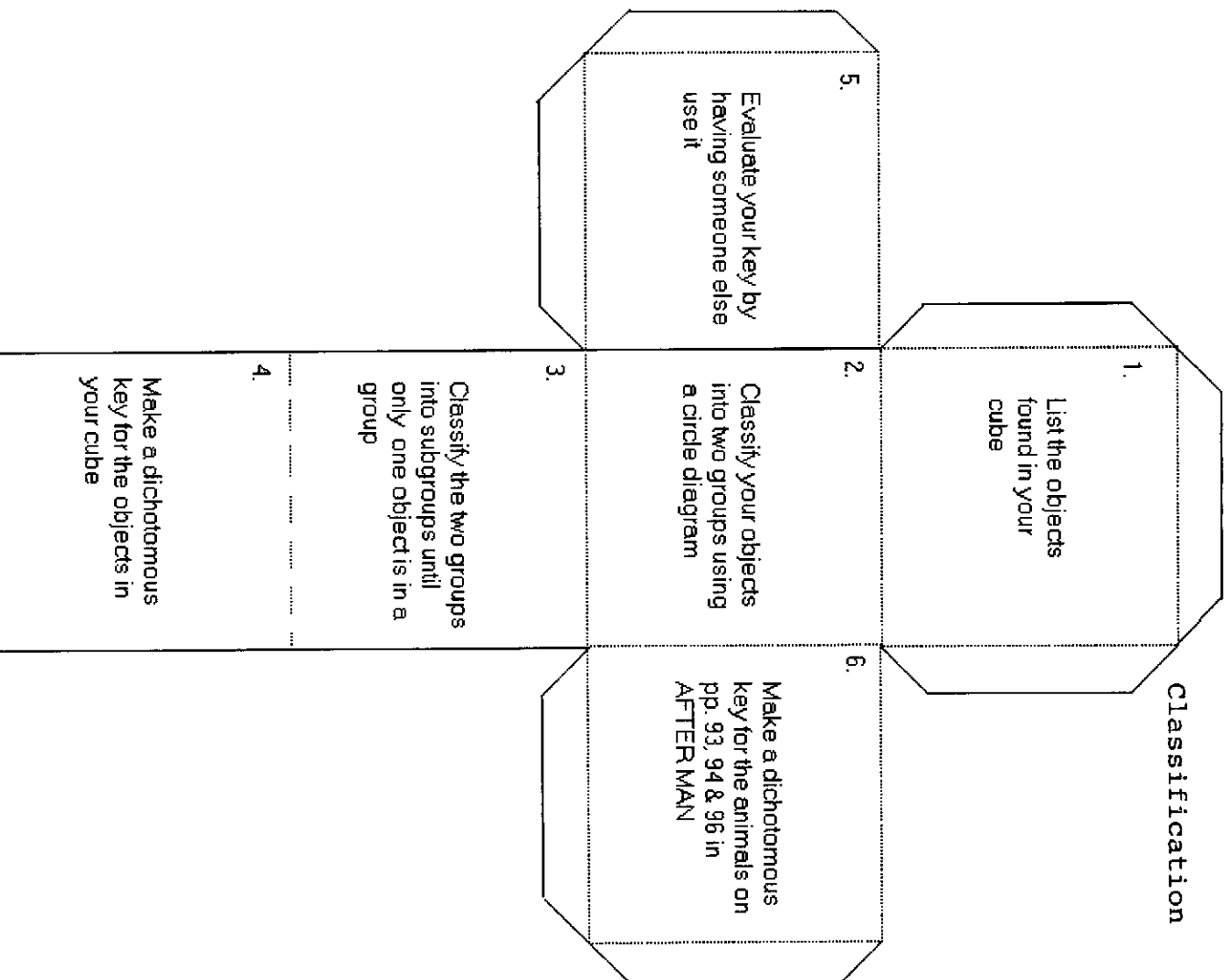


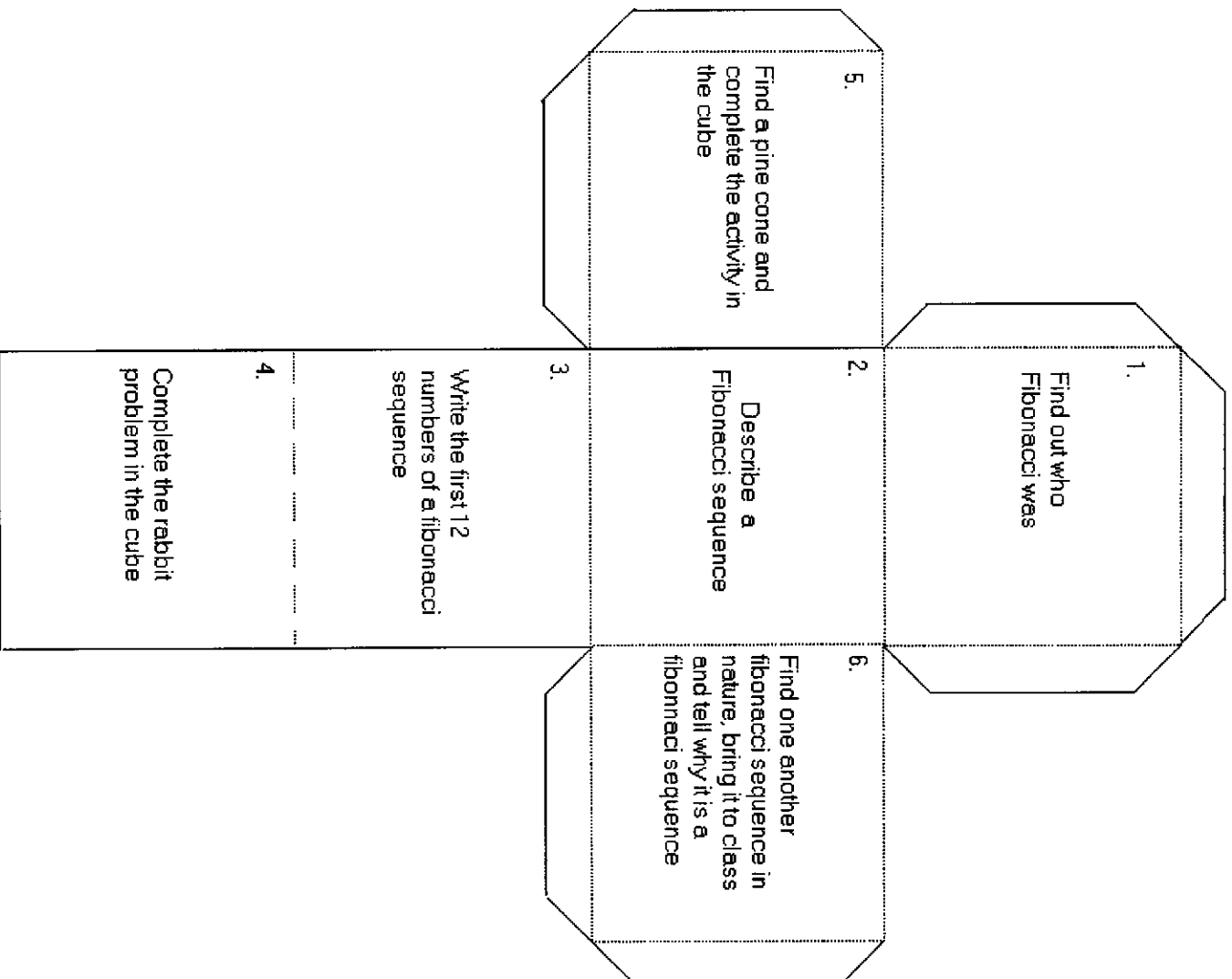


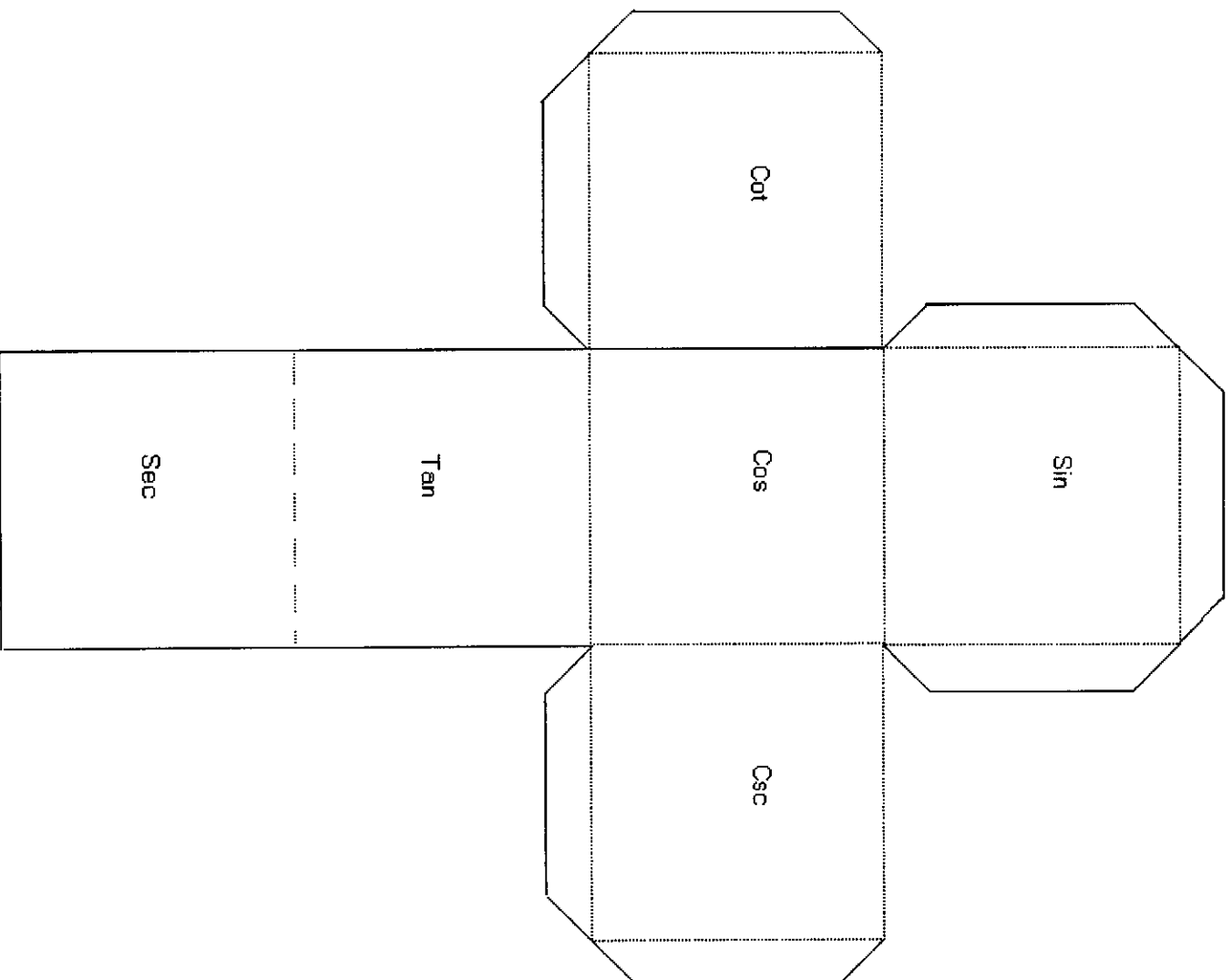
Classification

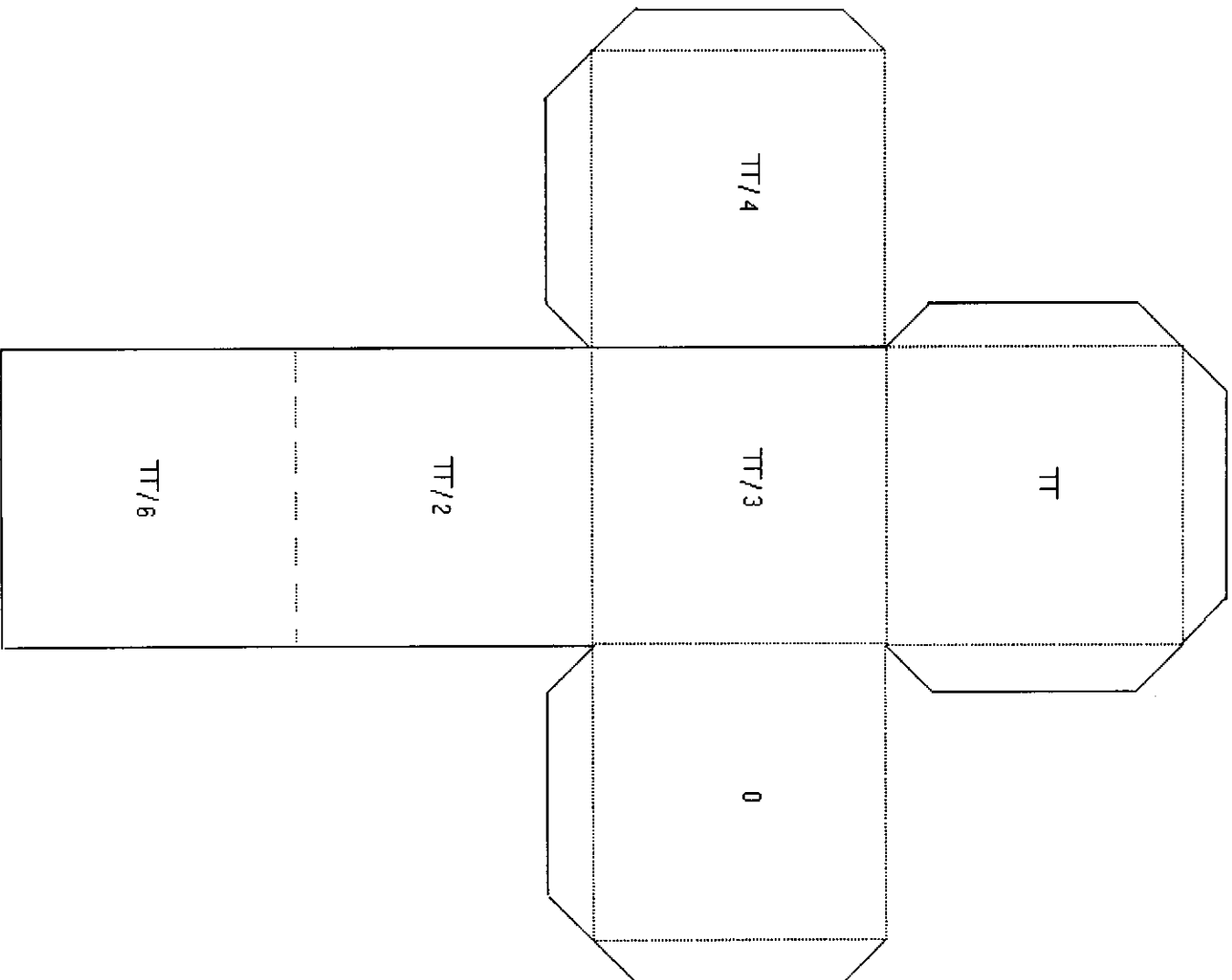
1. List the objects found in your cube	2. Classify the objects into two groups and choose a way t show your work	6. Collect six rocks or leaves and repeat 2, 3 & 4
3. Classify the two groups into two sub-groups		
4. Write four sentences, each one describing a different group and telling how that group is different from the other groups		
5. Repeat 2, 3, & 4 using the same materials and find another way to classify them.		

Classification

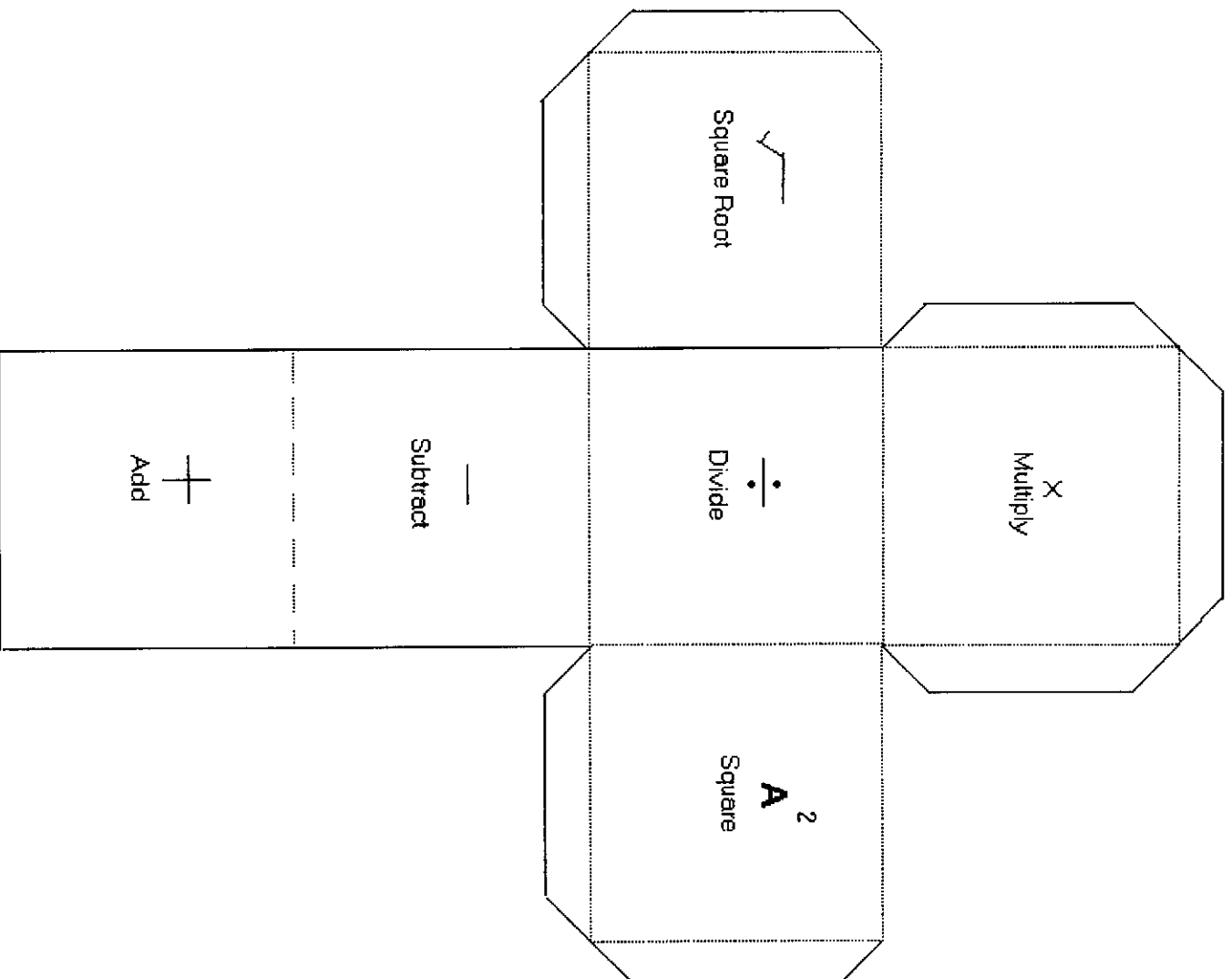


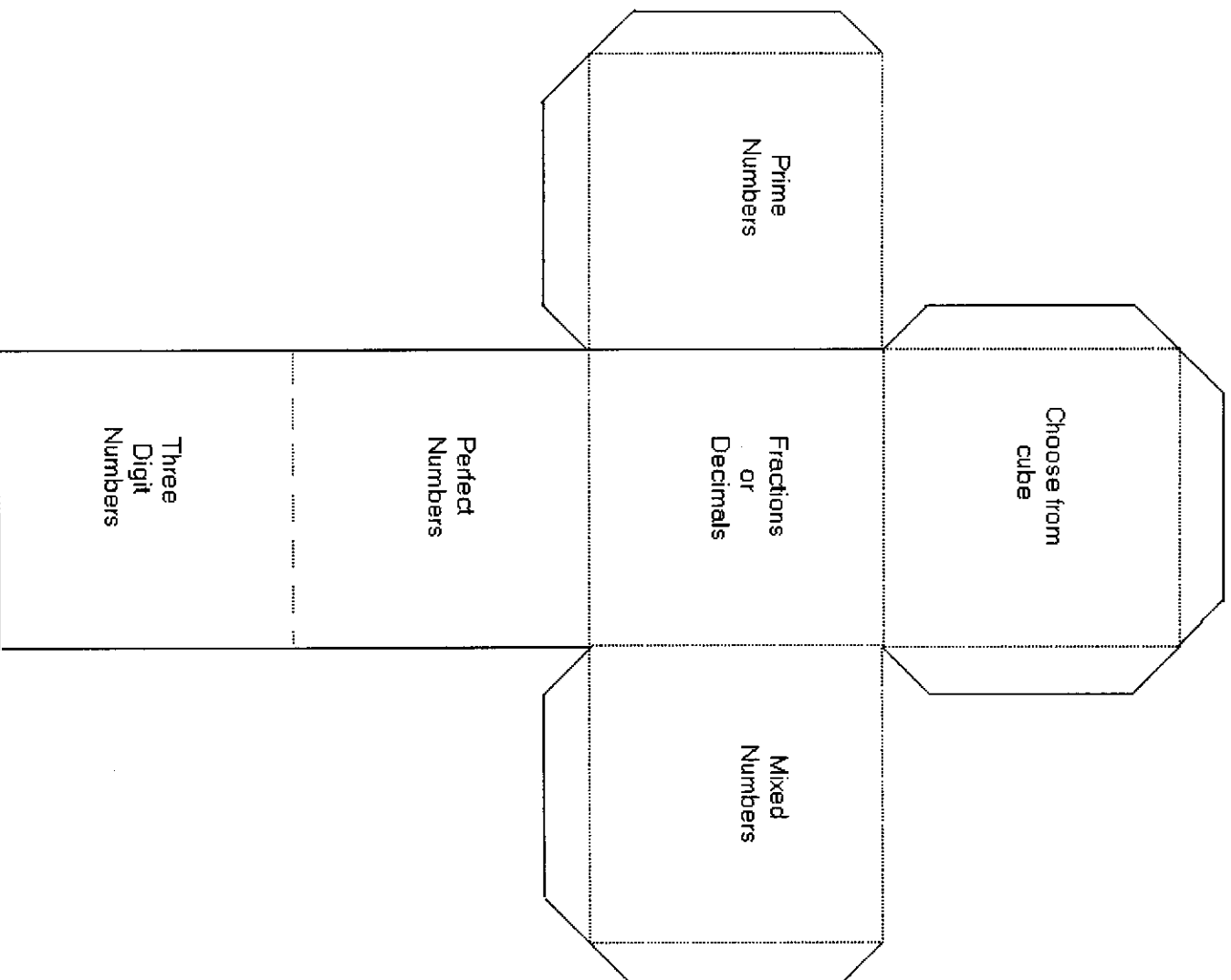




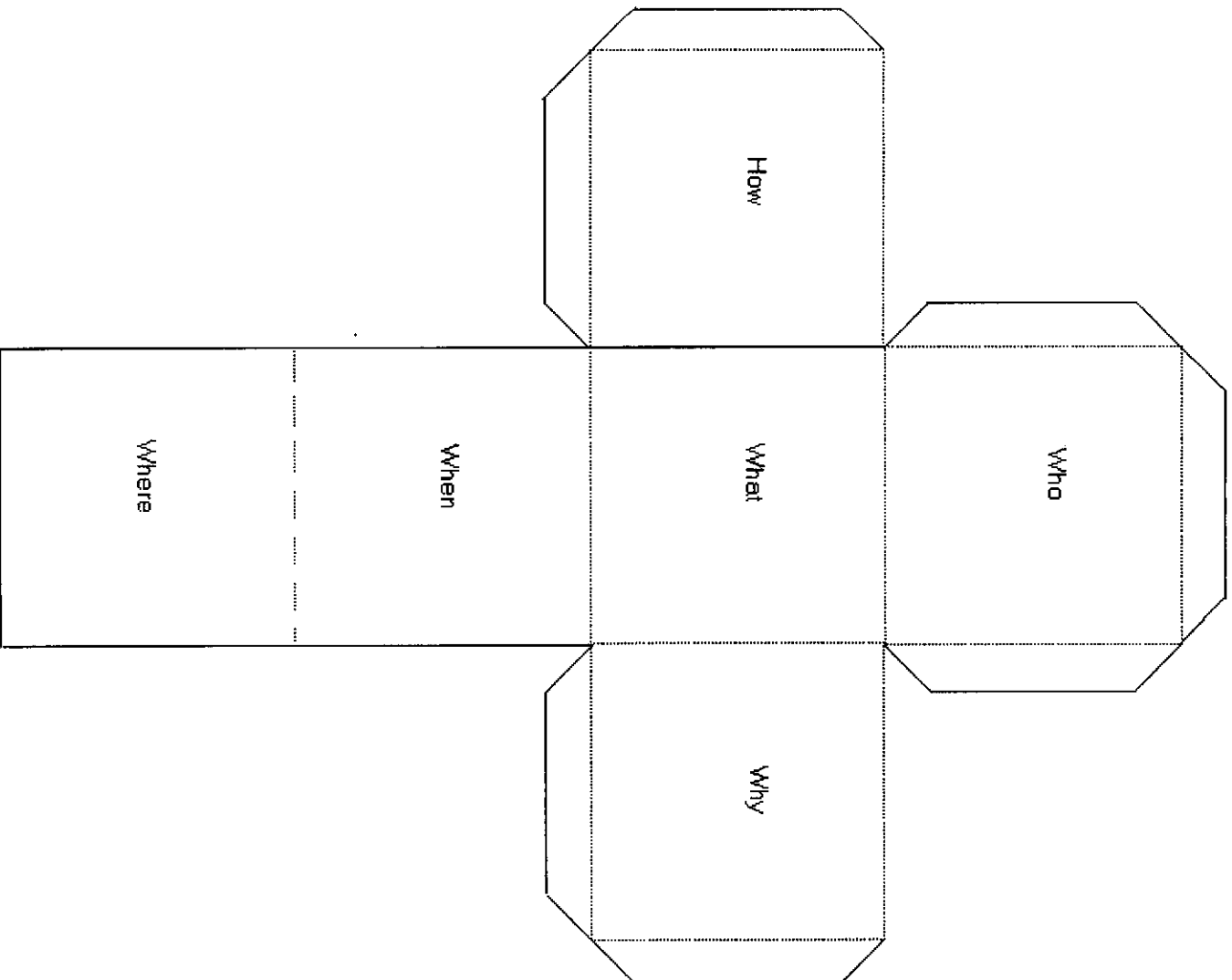


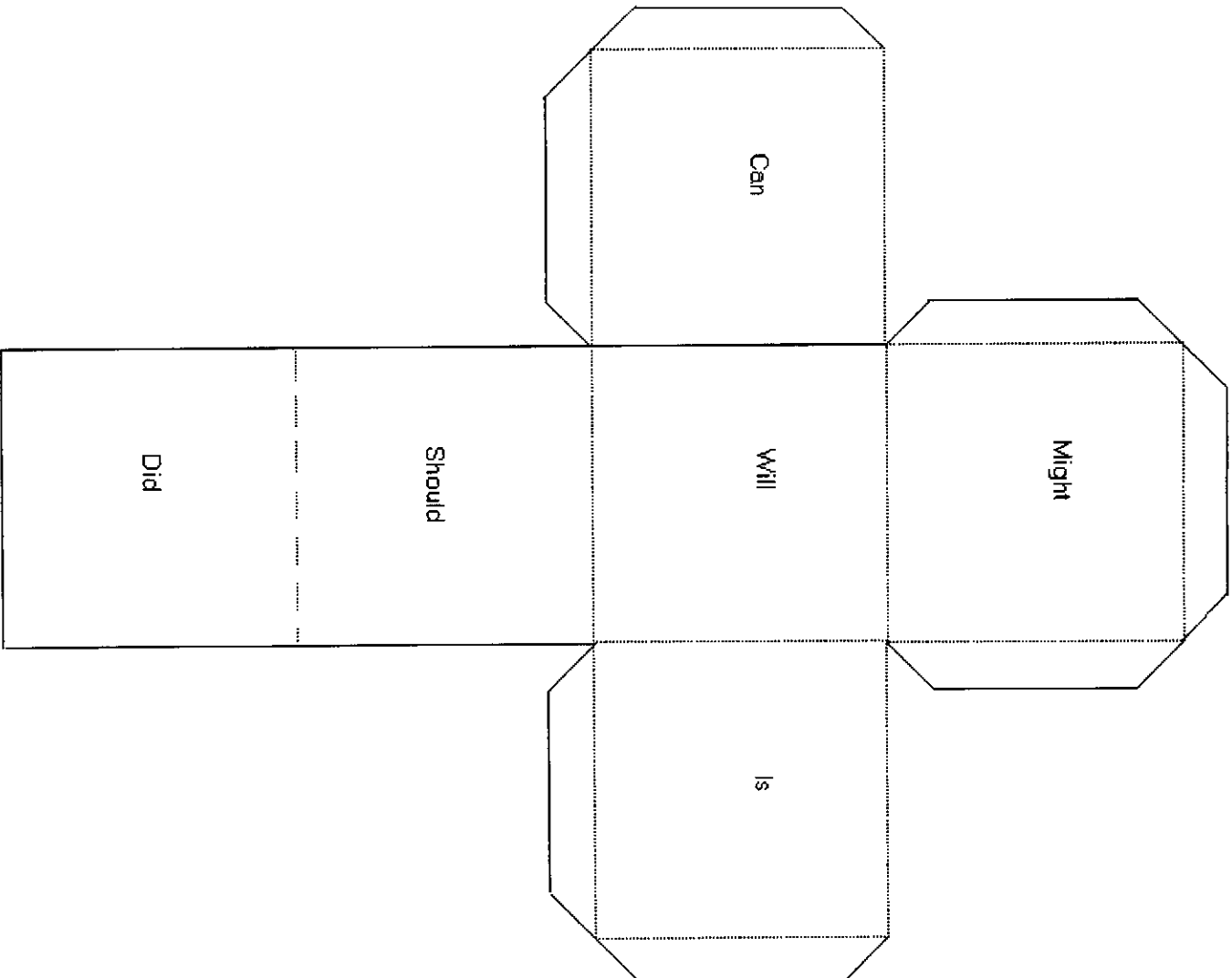
Cubing | Instruction





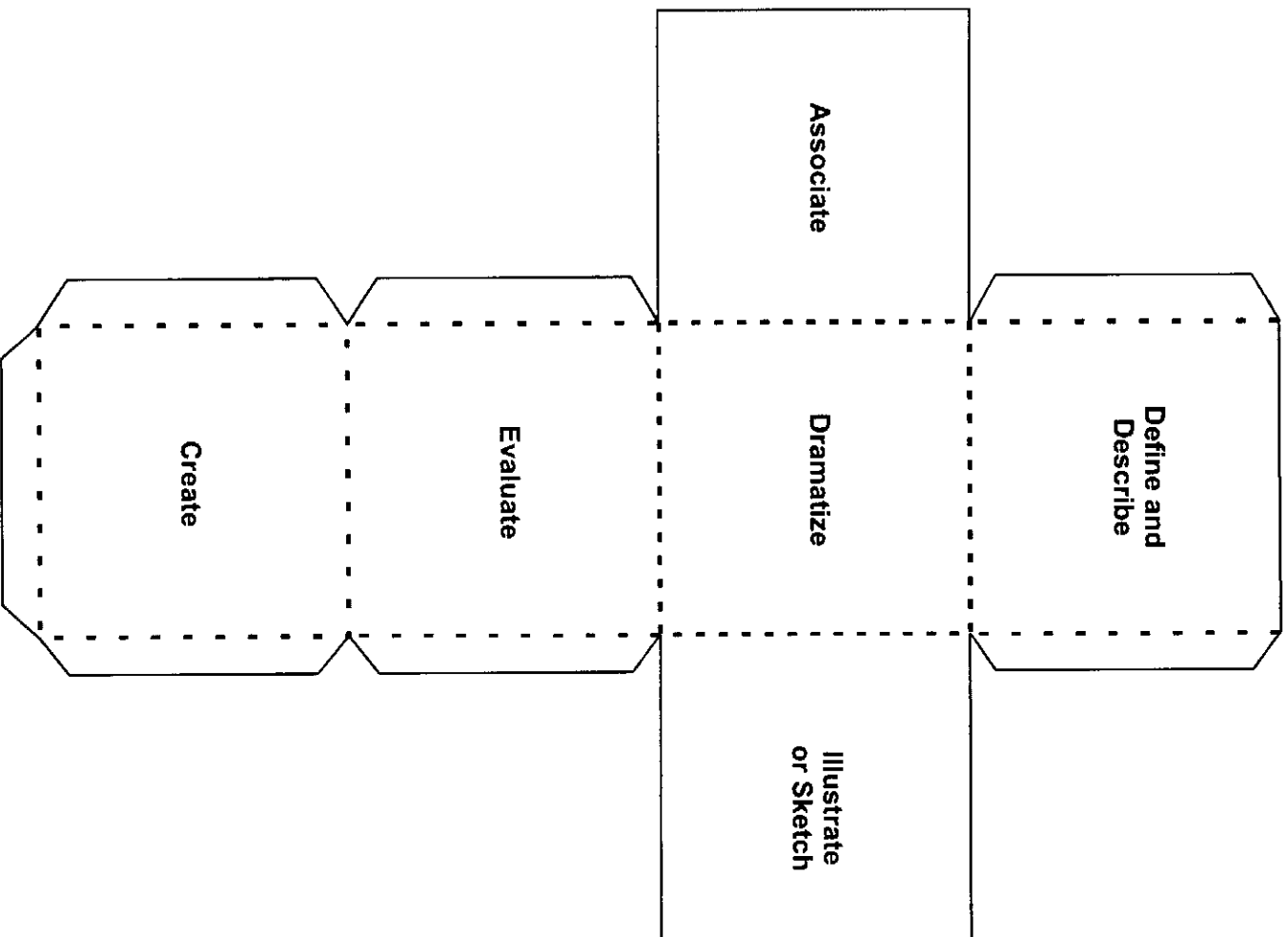
Cubing | Instruction



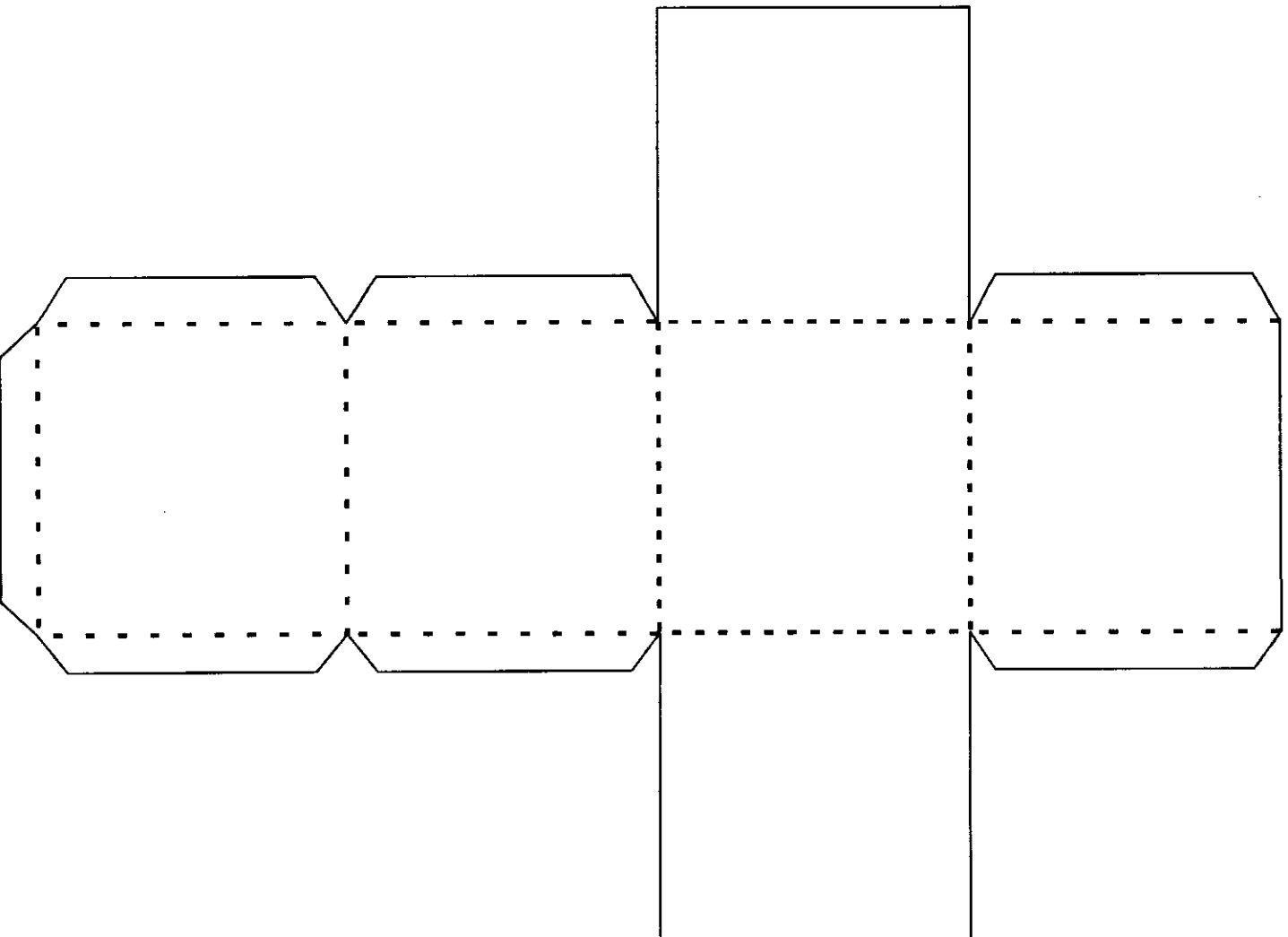


Cubing Instruction

Blackline Master 18:
Generic Cube



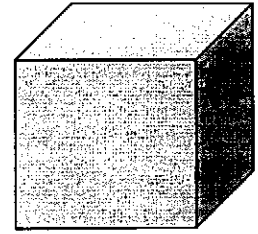
Blackline Master 19: Blank Cube



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Concerns?



Here is one – you may have more!

- Cubes can turn into glorified worksheets – but not if all activities are purposeful and focused on getting students to understand a concept in a multitude of ways!